Investment, inflation and economic growth nexus

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Abstract: The paper has twofold objectives. Firstly, the impact of the inflation rate on economic growth with the possibility of two threshold levels for Pakistan using annual data from 1961 to 2008 is examined and secondly, nonlinear relationship between inflation and investment has been investigated. Inflation and growth models support the existence of a nonlinear relationship with two thresholds (6 percent and 11 percent). Inflation below the first threshold affects economic growth positively but insignificantly; at moderate rates of inflation, between the two threshold levels, the effect of inflation is significant and strongly negative and at high rates of inflation, above the second threshold, the marginal impact of additional inflation on economic growth diminishes but is still significantly negative. Investment is one of the possible channels through which inflation influences economic growth and the analysis indicates the nonlinear relationship between these two variables with only one threshold at 7 percent. Rate of inflation below the threshold level has positive but insignificant impact, while above the threshold it has strong negative and significant impact on the investment. Therefore, it is desirable to keep the inflation below 6 percent because it may be helpful for the achievement of robust economic growth and investment.

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1. Introduction

High and sustainable economic growth and low inflation are the two main objectives of policy makers and the central bank. It is generally believes that inflation has negative and significant impact on economic growth in medium and long run (Khan and Senhadji, 2001). However, the existence and nature of relationship between inflation and economic growth and the channels through which it affects real economic activities has been the subject of considerable interest and debate. Because, the precise relationship between inflation and economic growth and the channels through which its affect transmitted into output is not known. Recent literature on this issue has uncovered some important findings.

Empirical literature on inflation growth nexus is divided into two main strands. One strand of literature has found negative and significant relationship between inflation and economic growth (Fisher, 1993; Barro, 1995; Bullard and Keating, 1995; Malla, 1997; Bruno and Easterly, 1998 and Faria and Carneiro, 2001) while other has confirmed positive and significant association between inflation and economic growth (Lucas, 1973; Mallik and Chowdhury, 2001 and Gillman and Nakov, 2004). These strands of literature highlight the possibility of non-linear relationship between inflation and economic growth. Several recent empirical studies have explored that whether the relationship between inflation and economic growth is in fact nonlinear. They are trying to support the hypothesis that low and stable inflation promotes economic growth and vice versa.

Fischer (1993) explored this possibility and noted the existence of nonlinear relationship between inflation and economic growth. He found that there is positive association between inflation and economic growth at low rate of inflation, and a negative one as inflation rose. Findings of Fischer (1993) generate new debate among the economists to determine precisely the level of inflation that promotes economic growth. In this context, various empirical studies are conducted.. Sarel (1996) found that before 1970s inflation rates were modest in most countries and empirical studies during this period show the evidence of a positive relationship between inflation and economic while after 1970s inflation rates started to be high and a negative relationship between these variables, beyond that time period, was observed. Bruno and Easterly (1998) examine the determinants of economic growth using annual CPI inflation of 26 countries which experienced inflation crises during the period between 1961 and 1992. Their empirical analysis predicts that inflation rate of 40 percent and over is considered as the threshold level of inflation.

Khan and Senhadji (2001) explored the inflation and growth relationship separately for industrial and developing countries and re-examine the issue of the existence of "Threshold" effects. Their results show that the threshold rate of inflation is 1- 3 percent for industrial countries and 7 – 11 percent for developing countries. Lee and Wong (2005) estimated the threshold levels of inflation for Taiwan and Japan using quarterly data set from the period between 1965- 2002 for Taiwan and 1970- 2001 for Japan. Their estimation of the threshold models suggest that an inflation rate beyond 7.3 percent detrimental for the economic growth of Taiwan. On the other hand, they found two threshold levels for Japan, which are 2.5 percent and 9.7 percent. They suggest that inflation rate below the estimated level of 9.7 percent is favorable to economic growth and beyond this threshold value it is harmful for the economic growth in Japan. Munir and Mansur (2009) investigate the non linear relationship between inflation rate and economic growth during the period of 1970-2005 for Malaysia. They found that threshold level of inflation is 3.9 percent and support the view that the relationship between inflation rate and economic growth is nonlinear. Inflation rate above the threshold level significantly retards growth rate of GDP and below the threshold level, it promote economic growth significantly. Sergii (2009) investigate the growth-inflation interaction for CIS countries for the period of 2001-2008 and found that when inflation level is higher than 8 % economic growth is slowed down, otherwise, it is promoted.

How then inflation affect growth and more particularly, what do gives rise to the so-called threshold effect in the relationship? What is the channel through inflation can affect growth in nonlinear settings? Recent literature highlights that investment might be consider as an important channel through which the impact of inflation is transmitted nonlinearly in economic growth. Investment, inflation and economic growth non linear nexus can be explained by using financial market development. Nonlinearity between inflation and financial development is well documented in literature (Boyd and Smith, 1998; Huybens and Smith, 1998, 1999; Boyd et al. 2001; Khan et al, 2001). A predictable increase in the rate of inflation can slow down financial market development. Inflation, a tax on real balance, reduces real returns to savings which in turn causes an informational friction afflicting the financial system. These financial market frictions results in credit rationing and thus limit the availability of investment and finally this reduction in investment adversely impacts economic growth. In endogenous growth literature, economic growth has depend on rate of return and inflation decreases rate of return (Nelson, 1976; Fama and Schwert, 1977; Gultekin, 1983 and Boyd et al., 1996), which leads to reduction in capital accumulation and hence decrease the growth rate. Inflation creates uncertainty in the financial market and increases the risk associated with the

investment which translated into reduction in economic activities (Hellerstein, 1997). Inflation can discourage investors by reducing their confidence in investments that take a long time to mature in stock market. There are few studies that explored the investment inflation relationship and hence its impact on growth. According to Barro (1995) reduction is economic growth is occurred due to reduction in the in the propensity to investment that is outcome of inflation. He further shows that an increase in average inflation by 10 percentage points per year cause reduction in the ratio of investment to GDP by 0.4-0.6 percentage points and this reduction in investment reduces the real per capita GDP by 0.2-0.3 percentage points per year. Therefore, inflation reduces the level of investment and hence reduction in investment adversely affects economic growth. Li (2006) estimates relationship between inflation and investment for 27 develop and 90 developing countries over the period 1961-2004 and found that relationship is nonlinear for both developed and developing countries.

Pakistan's economy has lost significant momentum in last few years. Deteriorated economic growth coupled with high inflation and low investment is major problems of Pakistan's economy. The growth rate of real GDP has gone down to 1.2 percent in 2008-09 from 9 percent in 2005-05. Investment is a key determinant of growth and its fluctuation reflects the intensification of economic activities. The total investment has declined from 22.5 percent of GDP in 2006-07 to 19.7 percent of GDP in 2008-09 and private sector investment was decelerating persistently since 2004-05 and its ratio to GDP has declined from 15.7 percent in 2004-05 to 13.2 percent in 2008-09. The inflation rate, measured as Consumer Price Index (CPI), has climbed to 22.3 percent during 2008-09 over the corresponding increase of 10.3 percent (GOP, 2010).

These statistics reveals that it is important to investigate the nexus among inflation, investment and economic growth. Few studies, in Pakistan, envisage the existence of non linear relationship between inflation and economic growth (Mallik and Chowdhury, 2001; Mubarik, 2005; and Hussain, 2005). Mubarik (2005) estimates the threshold level of inflation for Pakistan using an annual data set from the period between 1973 and 2000. He found that an inflation rate beyond 9-percent is detrimental for the economic growth while inflation rate below this level is favorable for the economic growth. Hussain (2005) empirically estimate the threshold level of inflation using standard econometric technique used for estimations of threshold effect for the period of 1973-2005 in Pakistan. He found no threshold level of inflation for Pakistan. These results are in sharp contrast to the findings of Mubarik (2005) where threshold level for Pakistan is at 9%. He suggests that

targeting inflation exceeding a range of 4 – 6 % will be a deterrent to economic growth and this range of inflation is tolerable for Pakistan.

Our study is different from other studies that were conducted for Pakistan. First, we focus on a more recent and long time series (1961 to 2008). Secondly, these studies focus on the existence of only one threshold level between these two variables by ignoring the possibility of second threshold in the relationship of inflation and growth. Thirdly, these studies have not examined the role of investment as a channel through which inflation affects economic growth.

The paper has twofold objectives. Firstly, the impact of the inflation rate on economic growth with the possibility of two threshold levels for Pakistan using annual data from 1961 to 2008 is examined and secondly, nonlinear relationship between inflation and investment has been investigated. Following questions are analyzed in this context:

1) Does a second threshold level exist in the inflation-growth relationship?

2) What is the relationship between inflation and investment? Does the effect of inflation on investment show a similar pattern to that inflation on economic growth?

The remainder of paper is organized as follows: Model specification is discussed in section 2. Data and descriptive statistics are explained in section 3. Results are presented in section 4 while conclusion and policy recommendation are in last section.

2. The Model Specification

The relationship between inflation and economic growth can be derived using the standard growth equation (Barro, 1991 and Sala-i-Martin, 1997):

$$d\log Y = X\beta + \varepsilon \quad \text{.....(1)}$$

Where Y is real output, X is a set of explanatory variables, β is slope coefficients attached with explanatory variables and ε is the error term. This basic growth equation is extended to captures the link between inflation and economic growth by using following equation:

$$d\log Y = \alpha_0 + \alpha_1 Inf + X\beta + \varepsilon \quad \text{.....(2)}$$

Where $d\log Y$ is growth rate of real GDP, Inf is growth rate of CPI and X is matrix of other explanatory variables, β matrix of slope coefficients and ε is the error term.

Neoclassical growth model uses investment and population growth in the growth analysis. Increase in investment together with a decrease in population growth rate promotes economic growth. International trade theory proposes to include openness of the economy in the growth regression which is positively related to growth. Money supply is important indicator for financial development. Development in financial sector is positively linked with economic growth. Finally, our empirical analysis uses the following explanatory variables: investment, population growth, M2 and openness of the economy. Choice of variables is consistent with the choice made by other researchers (Khan and Senhadji, 2001; Drukker et al. 2005; Mubarik, 2005; Hussain, 2005; Li, 2006; and Sergii, 2009).

So, our final regression model is as follow:

$$d\log Y = \alpha_0 + \alpha_1(Inf) + \beta_1(P) + \beta_2(INV) + \beta_3(F) + \beta_4(O) + \varepsilon \text{.....(3)}$$

Where $d\log Y$ is growth rate of real GDP, Inf is growth rate of CPI and P is population growth rate, INV is investment to GDP ratio, F is M2 to GDP ratio, O is openness ((Export + Import)/GDP) and ε is the error term.

Theoretical as well as empirical debate predict that threshold effects are associated with a rate of inflation exceeding some "critical value" or below some "critical value". Threshold Model was developed by Khan and Senhadji (2001) for the analysis of threshold level of inflation for industrialized and developing countries. Mubarik (2005) and Hussain (2005) use the same model for the estimation of threshold level of inflation in Pakistan. In this model only one threshold level was captured. We extend this model with the possibility of two threshold level in inflation growth nexus. By introducing two threshold level of inflation; following final regression model is designed:

$$d\log Y = \alpha_1 + \alpha_2(Inf) * I(Inf < \pi_1) + \alpha_3(Inf) * I(\pi_1 \le Inf \le \pi_2)$$
$$+ \alpha_4(Inf) * I(Inf > \pi_2) + \beta_1(P) + \beta_2(INV) + \beta_3(F) + \beta_4(O) + \varepsilon \text{.....(4)}$$

Where dependant variable and the control variable are defined as the same as in equation 3 while π_1 and π_2 are two threshold level of inflation. $I(Inf < \pi_1)$, $I(\pi_1 \le Inf \le \pi_2)$ and $I(Inf > \pi_2)$ are indicators functions which take the value of one if the term between parentheses is true and are zero otherwise. This model specifies the effects of inflation with three coefficients: α_2, α_3, and α_4. α_2 denotes the effect of inflation below the first threshold level π_1, α_3 denotes the effect of inflation on economic growth between π_1 and π_2, and α_4 denotes the effect of inflation on economic growth exceeding the second threshold level π_2.

Identification of threshold is based on the methodology defined by Khan and Senhadji (2001). Regression equation is estimated for different values of threshold which is chosen in an ascending order (i.e., 1, 2 and so on), the optimal value threshold is obtained by finding the value that maximizes the R^2 from the respective regressions. This also implies that the optimal threshold level is that which minimizes the residual sum of squares (RSS). This procedure has become widely accepted in the literature on this topic. Search of optimal threshold for wider range of threshold is very tedious. Moreover, Hansen (2000) proposed to search optimal value only in the region where do expect the threshold should be.

Theoretical literature indicates that investment might be the channel through which inflation hits economic growth. Following linear model specification is used to measure the relationship between investment and inflation:

$$INV = \delta_0 + \delta_1 Inf + \delta_2 INV_{t-1} + \varepsilon \text{.....(5)}$$

Where INV is the gross fixed capital accumulation as share of GDP and first lag of INV is included to control the economic conditions in the last period. With the possibility of two thresholds in investment inflation nexus, following model is designed:

$$INV = \delta_1 + \delta_2 (Inf) * I(Inf < \pi_1) + \delta_3 (Inf) * I(\pi_1 \leq Inf \leq \pi_2)$$
$$+ \delta_4 (Inf) * I(Inf > \pi_2) + \delta_5 (INV_{t-1}) + \varepsilon \text{.....(6)}$$

Selection of threshold level is based on the similar procedure explained for inflation and economic growth

3. Data and Descriptive Statistics

The data are taken from Economic Survey of Pakistan (various editions) and Fifty Year Economy of Pakistan (SBP). Data are ranging from 1961 to 2008. Following variables are used in analysis. Growth of real GDP is measured as annual percentage growth rate of GDP at constant prices based on 2000 prices. Inflation is measured as annual percent change of average consumer price index. Data for inflation are averages for the year and index is based on 2000=100. Growth rate of population is measured as annual population growth rate. Investment is measured as gross capital formation as percent of GDP. Openness of the economy is measured as share of export plus import in GDP.

Descriptive statistics of sample data shows that the average value of growth rate of output is 5.5 percent, and growth rate of population has the average value of 2.7 percent, investment has average value 18.1 percent and openness of the economy has average value 35.4 percent. Inflation has mean 7.8 percent while M2 as share of GDP has average value of 34.7 (Table 1).

Table 1: Descriptive Statistics

Variables	N	Mean	SD	Min	Max
GDP Growth Rate	48	5.48	2.09	1.20	9.80
Investment as % of GDP	48	18.08	2.15	12.93	22.95
Inflation	48	7.81	5.29	-0.52	26.66
Growth rate of population	48	2.67	0.33	1.78	3.19
M2 as % of GDP	48	34.76	4.89	24.28	46.69
Openness	48	35.39	3.19	28.85	42.62

The stationarity of the series is confirmed by applying Augmented Dickey–Fuller (ADF) test. Table 2 gives the result of ADF for all series. Real GDP growth rate and openness are stationary at level while Investment to GDP ratio, Inflation, Population Growth rate and M2 as % of GDP are non stationary at level and become stationary at first difference.

Table 2: Test for Non-Stationarity of Variables

Variables	Level			First Difference		
	No Trend	With Trend	Result	No Trend	With Trend	Result
GDP Growth Rate	-5.73	-6.01	Stationary	-	-	-
Investment as % of GDP	-2.12	-2.39	Non Stationary	-6.98	-6.99	Stationary
Inflation	-2.15	-2.86	Non Stationary	-4.60	-3.89	Stationary
Growth rate of population	-0.25	-2.44	Non Stationary	-3.77	-4.28	Stationary
M2 as % of GDP	-0.73	-1.44	Non Stationary	-5.92	-3.75	Stationary
Openness	-3.62	-3.76	Stationary	-	-	-

Note: 5% critical value is -2.87 for the case of no-trend, and -3.42 when a trend is included. AIC is used for lag selection.

4. Model Estimation

4.1 Inflation and Economic Growth Nexus

The simple linear model of economic growth and inflation as defined in equation 3 has been estimated. The basic purpose of simple linear regression is to reveal the shape of the growth function relating the inflation with economic growth. Result indicates that inflation has significant negative impact on economic growth at second lag[2]. One percent

[2] Mubarik (2005) and Hussain (2005) also found that inflation effect economic growth at second lag.

increases in inflation causes 0.2 percent reduction in growth rate of GDP. Investment has positive and significant impact on economic growth while population growth also has positive and significant impact on economic growth (Table 3). The coefficient of investment /GDP ratio is 0.65 which indicates that a 1 percentage point increase in investment will cause a 0.65 percentage pint increase in growth. Other variable like M2 to GDP ratio and openness was also used in the regression equation and finally both variables were drop due to their insignificant relationship with economic growth.

Table 3: Linear Estimation Results (Dependant Variable is GDP Growth Rate)

Variable	Coefficient	t-Statistic
Constant	-14.35769	-2.368223
Inflation	-0.198856	-3.274821
Investment	0.651056	3.573079
Population	0.036202	2.696865

R-Squared = 0.31; DW = 2.12; Jarque-Bera = 0.12; Ramsey RESET Test (1, 41) = 1.11 [0.30]

Nonlinear model has been estimated using equation 4. For estimation of π_1 and π_2, we apply the methodology given in section 2. First, we estimate the equation 3 with one threshold level. With the possibility of one threshold level, we reformulate equation 3 as follow:

$$d\log Y = \alpha_1 + \alpha_2(Inf) * I(Inf \leq \pi_1) + \alpha_3(Inf) * I(Inf > \pi_1) + \beta_1(P) + \beta_2(I) + \varepsilon \text{.....(7)}$$

We apply a range of threshold level ranging from 1 to 8 and choose the value that minimizes the error sum of square as mention by Hansen (2000). Finally, result indicates that the value of π_1 is 6 and inflation below 6 percent has positive but insignificant impact on economic growth (Appendix Table 1-A & Table 1-B). Then, we carry out a significant test of no threshold against one threshold π_1. The null hypothesis is $H_0 = \alpha_2 = \alpha_3$ against the alternative of $H_0 = \alpha_2 \neq \alpha_3$. The result indicates that null hypothesis is rejected at 5 percent level of significance which confirms the existence of one threshold level in inflation data.

The existence of second threshold in the relationship between growth and inflation is tested by using equation 4. By using same process we find the second threshold level which is 11 (Table 4). Then, we carry out a significant test of one threshold against two thresholds. The null hypothesis is existence of only one threshold against the alternative of existence of two thresholds. The result supports the existence of two thresholds against one at 5 percent level of significance.

Our findings show that for the low inflation below the fist threshold level, the coefficient of inflation (0.18) is positive which implies that 1 percentage increase in

inflation will cause a 0.18 percentage point increase in economic growth. However, this positive impact is not significant. This indicates that, in Pakistan, low inflation upto 6 is not harmful for the country[3]. In the middle range of inflation i.e. between two threshold level (inflation between 6 and 12), the coefficient of inflation (-0.32) is negative and significant at one percent level. Results show that an increase in one percentage point inflation per year is associated with a reduction of the growth rate of real GDP by 0.32 percentage point. When inflation rate is exceeding the 11 percentage point i.e. above the second threshold level, the coefficient of inflation (-0.06) is still negative and significant. However, this negative effect is smaller than that when inflation is in the range of 6 to 11. A one percentage increase in inflation, when inflation rate is more than eleven percentage point, a reduction of 0.06 percentage point is occur in real GDP growth rate.

Table 4: Estimation with Thresholds Effect (Dependant Variable is GDP Growth Rate)

Variable	Coefficient	t-Statistic
Constant	-10.16507	-1.596767
Inflation <6	0.183643	0.517296
Inflation>=6 and Inflation <=11	-0.322854	-2.611079
Inflation > 11	-0.056985	-3.827330
Investment	3.449236	2.593879
Population	0.512724	2.622883

R-Squared = 0.37; DW = 2.02; Jarque-Bera = 0.09; Ramsey RESET Test (1, 39) = 0.34 [0.56]

The existence of two threshold levels implies that inflation can be divided into three parts. As inflation rises from zero to six percentage point, the effect on economic growth is negligible or even positive. As inflation crosses the low threshold level, it has significant and negative impact on the GDP up to a certain level. When inflation crosses second threshold level, the marginal adverse impact of inflation on growth diminishes. The smaller negative coefficient illustrate that the inflation growth relationship flattens when the economy has high inflation. Intuitively, we can say that once inflation exceeds a threshold level, all of the damage to the financial system has already been done, and then perfect foresight dynamics comes into being. When these occur, further increases in inflation have no additional detrimental effects on economic growth (Li, 2006).

4.2 Inflation and Investment Nexus

Theoretical literature has suggested that investment might be the channel that link inflation to economic growth. The linear model is estimated by using equation 5 to

[3] Mubarik (2005) found that in Pakistan, inflation up to 9 is not harmful while Hussain (2005) found that inflation between 4% to 6% is feasible

uncover the relationship between inflation and investment. Results indicate that inflation has significant and negative impact on investment/GDP ratio. The coefficient of inflation (-0.08) shows that a 1 percentage point increase in inflation will cause a 0.08 percentage point reduction in investment. The first lag of investment is used to control the economic conditions in the last period which has significant and positive impact on current investment (Table 5). This linear analysis confirms the inflation-investment/GDP nexus like inflation and GDP growth. A dummy variable ranging from 1973 to 1981 is used to make data stable and normal.

Table 5: Linear Estimation Results (Dependant Variable is Investment/GDP Ratio)

Variable	Coefficient	t-Statistic
Constant	7.682031	3.179267
Inflation	-0.084268	-1.940828
Lag of Investment	0.589304	4.515194
Dummy from 1973 to 1981	-0.945999	-1.699239

R-Squared = 0.55; DW = 1.80; Jarque-Bera = 0.08; Ramsey RESET Test (1, 40) = 1.13 [0.32]

Nonlinear model of investment and inflation is estimated using equation 6. By applying same process as given for inflation and growth, a single threshold at 7 percent is estimated because we cannot reject the null hypothesis of one threshold against 2 thresholds. Table 6 presents the estimation results of the inflation-investment relationship with threshold effects. The coefficient of inflation (0.05) is positive but insignificant when inflation is below the threshold level. However, as inflation rates exceed the threshold level, the effect of inflation on the level of investment is negative and significant. The coefficient of inflation (-0.07) shows that a 1 percentage point increase in inflation will cause a 0.07 percentage point reduction in investment as inflation rose from threshold level. These evidences suggest that during a period of high inflation, the level of investment be adversely affected by inflation.

Table 6: Estimation with Thresholds Effect (Dependant Variable is Investment/GDP Ratio)

Variable	Coefficient	t-Statistic
Constant	7.878550	3.277259
Inflation <7	0.047665	0.608740
Inflation >=7	-0.067759	-1.949206
Lag of Investment	0.579052	4.459827
Dummy from 1973 to 1981	-0.991533	-1.795522

R-Squared = 0.57; DW = 1.81; Jarque-Bera = 0.06; Ramsey RESET Test (1, 40) = 0.11 [0.74]

5 Conclusion and Policy Options

The objective of the present study has been twofold. Firstly, the impact of the inflation rate on economic growth with the possibility of two threshold level for Pakistan using annual data from 1961 to 2008 has been examined and secondly, nonlinear relationship between inflation and investment is also explored.

Inflation and growth models support the existence of a nonlinear relationship with two thresholds. Existence of a double threshold divides the inflation into three categories i.e. low inflation, moderate inflation and high inflation. Inflation, below the first threshold (6 percent), affects economic growth positively but insignificantly; at moderate rates of inflation, between the two threshold levels (between 6 percent and 11 percent), the effect of inflation is negative and significant; and at high rates of inflation, above the second threshold (above 11 percent), the marginal impact of additional inflation on economic growth diminishes but it is still negative and significant.

The second objective of the study is to explore the mechanism through which inflation affects long-run economic growth in nonlinear settings. Investment is one of the possible channels through which inflation affects economic growth. The analysis indicates the nonlinear relationship between these two variables with only one threshold at 7 percent. Rate of inflation below the threshold level has a positive but insignificant impact on investment, while above the threshold it has strong negative and significant impact on the investment.

These findings provide some important policy implications. The analysis shows that it is desirable to keep the inflation below than 6 percent and therefore central bank should concentrate on those policies which keep the inflation rate below the first threshold because it may be helpful for the achievement of robust economic growth. Higher inflation than the threshold would have adverse consequences for growth. Monetary policy must be designed to stabilize the prices and curb inflation. Low inflation is also helpful for minimizing the uncertainties in the financial market which in turn boost investment in the country. Better coordination between monetary and fiscal polices is required to achieve both objectives i.e. high and sustain growth with low inflation.

Appendix:

Appendix Table 1-A: Estimation of One Threshold Level (Dependant Variable is GDP Growth Rate)

Variable	Coefficient	t-Statistic
Constant	-13.94929	-2.110006
Inflation <6	0.240981	0.924573
Inflation >=6	-0.203435	-3.087819
Investment	0.639304	3.232172
Population	0.035727	2.572852

R-Squared = 0.32; DW = 2.14; Jarque-Bera = 0.11; Ramsey RESET Test (1, 40) = 1.19 [0.28]

Appendix Table 1-B: Estimation of One Threshold Level (Dependant Variable is GDP Growth Rate)

Variable	Coefficient	t-Statistic
Constant	-10.90925	-1.748677
Inflation <=6	-0.561443	-2.596820
Inflation > 6	-0.249473	-3.786838
Investment	0.515003	2.651303
Population	0.035711	2.725498

R-Squared = 0.36; DW = 2.01; Jarque-Bera = 0.08; Ramsey RESET Test (1, 40) = 1.08 [0.30]

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